## 204-038

## EFFECT OF SINTERING TIME AND TEMPERATURE ON PROPERTIES OF HIGH PRESSURE ASSISTED WC/CO HARDMETAL COMPOSITE

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WC/Co is widely used as cutting tools, because has a unique combination of high strength, hardness, toughness, and moderate stiffness, especially with fine grained WC and finely distributed cobalt. WC/Co powder mixture sinters by different methods such as vacuum sintering, microwave sintering and SPS. High pressure high temperature (HPHT) sintering is a proposed method that can results in better distribution of cobalt and avoid undesirable phases by using high pressure, high temperature and very low sintering time. In this study, a powder mixture of WC- 10 wt% Co was sintered by HPHT at 1500 to 1900°C under a pressure of 7.7 GPa for 2 and 3 minutes. Microstructural/structural analyses were performed by SEM/EDS and XRD. Hardness was also done to obtain the effect of sintering parameters. It was found that increasing sintering time in HPHT sintering method at a constant temperature can improve properties of WC/Co hard metal. It was also realized that both sintering temperature and time have effect on hardness and density.